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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/398,652	09/17/1999	WILLIAM A. SAMARAS	042390.P5120D	1359

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EXAMINER

CHANG, RICK KILTAE

ART UNIT PAPER NUMBER

3729

DATE MAILED: 12/01/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/398,652

Applicant(s)

SAMARAS ET AL.

Examiner

Rick K. Chang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 19, 21, 22 and 24-26 is/are pending in the application.
- 4a) Of the above claim(s) claims that are not recited in Item 6 below is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 19, 21 and 26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 9/16/03 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 19, 21 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seidel (US 5,635,847) in view of Gedney et al (US 5,483,421), and further in view of Beers (US 5,680,936), Degani et al (US 5,990,564) and Hamzehdoost et al (US 5,689,091) and Mennitt et al (US 5,334,857).

Re claim 19: Seidel discloses providing an interposer (10); coupling solder balls (12) to the interposer (10) to selected locations; coupling a plurality of semiconductor dice (11) to the first surface (the surface where 11s are mounted); and testing the plurality of semiconductor dice (11) on the interposer (col. 1, lines 20-34 and col. 2, lines 46-51).

Seidel fails to disclose populating the second surface with a plurality of conductive pads; coupling the solder ball to only preselected conductive pads of the plurality of conductive pads

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that are intended to be used, the preselected conductive pads being less than all of the plurality of conductive pads; coupling a plurality of cache memory devices and at least one passive device to the first surface; coupling the interposer to a substrate with the solder balls after the testing if the plurality of semiconductor dice pass the testing; testing only a portion of those conductive pads that have solder balls attached to the plurality of conductive pads on the interposer; not coupling solder balls to non-selected locations; and coupling a microprocessor device to the substrate.

Gedney discloses populating the second surface with a plurality of conductive pads (32); coupling a solder ball (44) to each of preselected ones of the plurality of conductive pads (32); coupling the interposer (24) to a substrate (38) with the solder balls (44); and coupling at least one other semiconductor device (Fig. 4 shows a third semiconductor device (20 and 24) is mounted on 38) to the substrate (38) thereby forming a multi-chip subassembly and mounting this subassembly to printed circuit cards (col. 1, lines 7-8) without any defective components.

Beers discloses coupling at least one passive device (see annotated Fig. 3 below) thereby regulating voltage and current to the electronic dice.

Hamzehdoost discloses not coupling solder balls to non-selected locations (the conductive metal layer 30 is covered with a compatible material, except for selective solderable areas 36 where it is desired to have the solder balls applied (col. 3, lines 47-450) and see col. 3, lines 61-63) thereby saving production cost and making the package lighter for saving fuel cost.

Degani discloses mounting a plurality of cache memory devices and a microprocessor device on an interposer to use in a computer to perform computation and temporarily store program applications.

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Mennitt discloses coupling the solder ball to only preselected conductive pads of the plurality of conductive pads that are intended to be used, the preselected conductive pads being less than all of the plurality of conductive pads (Figs. 2 and 5 show connecting the solder ball to only preselected conductive pads of the plurality of conductive pads that are intended to be used, the preselected conductive pads being less than all of the plurality of conductive pads).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Seidel by populating the second surface with a plurality of conductive pads ; coupling a solder ball to each of preselected ones of the plurality of conductive pads; coupling the interposer to a substrate with the solder balls; and coupling at least one other semiconductor device to the substrate, as taught by Gedney, for the purpose of forming a multi-chip subassembly and mounting this subassembly to printed circuit cards without any defective components.

Further, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Seidel by not coupling solder balls to non-selected locations, as taught by Hamzehdoost, for the purpose of saving production cost and making the package lighter for saving fuel cost.

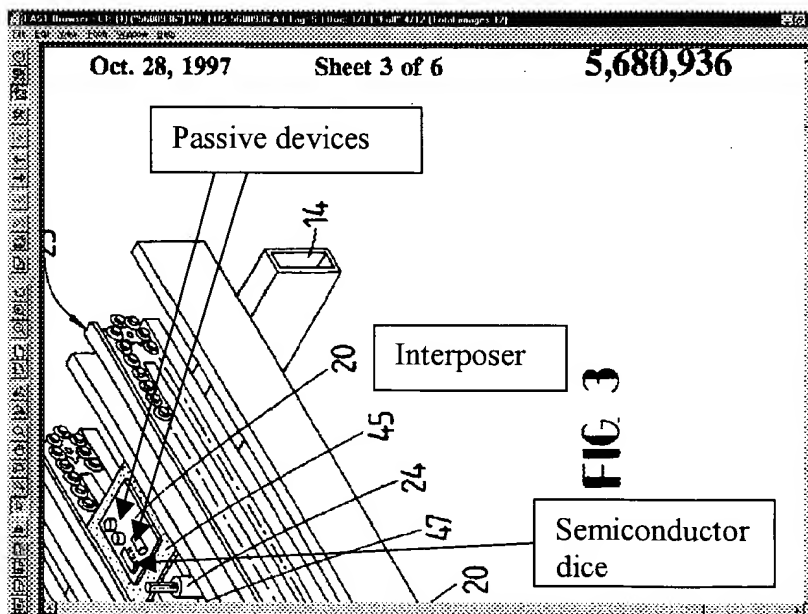
Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Seidel by coupling at least one passive device to the first surface of the interposer, as taught by Beers, for the purpose of regulating voltage and current to the electronic chip.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Seidel by coupling the solder ball to only preselected conductive pads of the

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plurality of conductive pads that are intended to be used, the preselected conductive pads being less than all of the plurality of conductive pads, as taught by Mennitt, for the purpose of saving space and production cost by eliminating solder balls which are not needed by the device user.

In addition, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Seidel by mounting a plurality of cache memory devices and a microprocessor device, as taught by Degani, to use in a computer to perform computation and temporarily store program applications.



Re claim 21: Seidel teaches the invention as described with respect to claim 19 above.

Seidel fails to disclose providing the interposer having organic material.

Gedney discloses providing the interposer (24) having organic material (col. 7, lines 15-16) thereby providing low thermal coefficient of expansion.

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It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Seidel by providing the interposer having organic material, as taught by Gedney, for the purpose of providing low thermal coefficient of expansion.

Re claim 26: Seidel teaches the invention as described with respect to claim 19 above.

Seidel fails to disclose creating a plurality of contacts on the substrate; and electrically connecting the preselected conductive pads to the plurality of contacts.

Mennitt discloses creating a plurality of contacts (16) on the substrate (12) and electrically connecting the selected ones of the plurality of conductive pads to the plurality of contacts (Fig. 3).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Seidel by creating a plurality of contacts on the substrate; and electrically connecting the preselected conductive pads to the plurality of contacts, as taught by Mennitt, for the purpose of allowing signal to travel from one part of the component to another and providing power and ground to the device.

NOTE: Please provide reference numerals (either in parentheses next to the claimed limitation or in a table format with one column listing the claimed limitation and another column listing corresponding reference numerals in the remark section of the response to the Office Action) to all the claimed limitations as well as support in the disclosure for better clarity. Applicants are duly reminded that a full and proper response to this Office Action that includes any amendment to the claims and specification of the application as originally filed requires that the applicant point out the support for any amendment made to the disclosure, including the claims. See 37 CFR 1.111 and MPEP 2163.06.

Response to Arguments

4. Applicant's arguments with respect to claims 19, 21 and 26 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

5. **Please provide reference numerals (either in parentheses next to the claimed limitation or in a table format with one column listing the claimed limitation and another column listing corresponding reference numerals in the remark section of the response to the Office Action) to all the claimed limitations as well as support in the disclosure for better clarity. Applicants are duly reminded that a full and proper response to this Office Action that includes any amendment to the claims and specification of the application as originally filed requires that the applicant point out the support for any amendment made to the disclosure, including the claims. See 37 CFR 1.111 and MPEP 2163.06.**

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rick K. Chang whose telephone number is (703) 308-4784. The examiner can normally be reached on 5:30 AM to 1:30 PM, Monday through Thursday.

The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9302 for regular communications and (703) 872-9303 for After Final communications.



**RICHARD CHANG
PRIMARY EXAMINER**